17-2

Report on Damage to Railroad and Highway Bridges in North Vietnam

The U. S. and South Vietnamese air strikes against major North Vietnamese railroad and highway targets have achieved the objective of making it more difficult and costly for the DRV to support military operations in South Vietnam and Laos but have not reduced the capacities below the level required for its support of operations at current combat rates.

In analyzing the time intervals of the interdictions, there are two general points which render it difficult to draw valid conclusions. First and most important is the fact that recuperative action is taken by the DRV according to need for the LOC facility and delays in restoration do not necessarily indicate lack of capability to restore service. For example, several bridges that were destroyed during the war with the French have not yet been restored. The availability and the construction of suitable alternatives to bypass the interdicted structure also affect the recuperative effort.

Secondly, it is often difficult to determine the precise length of time that a line remained out of service because of the lack of photographic reconnaissance or other intelligence over all targets struck to determine their daily status.

Railroad Damage

a. Hanoi-Lao Cai Rail Line

Of the 80 bridges 40 feet or over in length on this line, three are JCS targets but only one of these three, the Lang Bun Railroad Bridge 25X1 [redacted] is within the authorized strike area. Of the other two JCS 25X1 targets, one [redacted] the Lang Con Railroad Bridge Northwest over the Ngoi Niai), about 90 feet long, is north of the Lang Bun bridge and the 25X1 other [redacted] the Viet Tri Railroad and Highway Bridge over Riviere Claire) is a 970 foot structure situated near a populated area about 40 miles northwest of Hanoi.

DIA review(s) completed.

It is estimated that from 11 July to early in December thru traffic on the Lao Cai rail line was not possible. Whereas portions remained open to shuttle traffic and at times approached complete operational status, it is believed that some interdictions remained until early December. The line was reported as probably operational in early December and on 21 December photography revealed that the line had been restored to allow thru traffic.

Interruption of rail service was maintained successfully by destroying numerous small bridges at rather close intervals and by destroying one JCS targeted bridge, the Lang Bun [redacted] Originally it was a 150-foot two-span steel bridge. Destroyed for the first time on 27 August, it remained out of service for at least 33 days but not more than 44 days. No attempt to repair this structure was made until after 19 September but by 9 October a new bridge was in place and operational. Restoration time, once work began, was 20 days or less. This bridge was restruck in late October (precise date cannot be determined) and 80 feet of the structure was confirmed down on 29 October; by 9 November, however, it was again operational. Restoration of service time was 11 days or less. Reported struck again on 12 December but without post strike photographic coverage, this bridge was confirmed by 20 December photography to be operational.

25X1

The smaller bridges on this line have not been designated as JCS targets but many have been attacked. The longest of these, the 92-foot long Lang Kay Railroad Bridge over the Ngoi Kay [redacted] was struck on 19 October and restored to service by 3 December.

25X1

25X1

Details of strike on [redacted] and on the non-JCS targets struck on the Hanoi-Lao Cai Rail Line are set forth in Tab A. It is noted that for some of the non-JCS targets, service has been restored in as little as 8 days or less once work had started. Since the DRV has demonstrated the desire and the ability to restore rail bridges expeditiously, it is estimated that they have the capability to restore service over 60-90-foot bridges in 2 to 3 days, although there is no evidence yet of this actual performance.

Attached as Tab D are Photo Intelligence Briefing Notes on Briefing Board 12-65-44 and a copy of the briefing board entitled "North Vietnam Railroad Bridge Reconstruction - Lao Cai Line."

b. Hanoi-Dong Dang Rail Line

Of the 30 bridges 40 feet or over in length on this line 8 are JCS targets. They are as follows:

25X1

[redacted]

Lang Son Railroad and Highway Bridge Over Song Ky Cung

Lang Dang Railroad Bridge Over Song Thuong

Cao Nung Railroad Bridge Over Song Hoa

Vu Chua Railroad Bridge Over Suoi Ngang

Bac Giang Railroad and Highway Bridge Over Song Thuong

Dap Cau Railroad and Highway Bridge Over Song Cau

Hanoi Railroad and Highway Bridge Over Canal des Rapides

Hanoi Railroad and Highway Bridge Over Red River

25X1 Two of these [redacted] have been destroyed and a third
25X1 target [redacted] was attacked resulting in a crater to its approach.

Air strikes were directed for the first time against this line on 20 September with the strike on [redacted] the Cao Nung Railroad Bridge. 25X1
Photography of 6 October revealed that this bridge was possibly out of service for a very short period following that strike. Restruck on 16 November, the southwest approach was cratered but the bridge was not

destroyed. As a result of a third strike on the bridge on 1 December, three of the six spans were dropped; photography of the same day confirming the destruction. It is estimated that the bridge could be restored to operational status within four weeks. The present status of the bridge is not known as no photographic coverage has been received since the 1 December photography which confirmed the destruction of the target.

25X1 On 7 October, [redacted] the Vu Chua Railroad Bridge was struck but its destruction was not confirmed until 31 October when photography revealed a new structure in place and operational. This 99-foot bridge was out of operation for less than 24 days. On 20 December, the Vu Chua bridge was restruck and pilots reported dropping a span and damaging one abutment. The photographic reconnaissance aircraft which accompanied this mission obtained its coverage of the target during the initial phases of the strike and the IPIR based on that photography was inconclusive as the strike continued for several minutes after the photographic reconnaissance aircraft left the target area.

Four aircraft which were scheduled to strike [redacted] the Cao Nung Railroad Bridge on 16 November were unable to locate the primary target due to weather and attacked an unidentified railroad bridge. Photography of the same date revealed a crater in the railroad bed near [redacted] 25X1
25X1 [redacted] the Lang Dang Railroad Bridge. 25X1

The Hanoi-Dong Dang Rail Line was operational from 31 October until 1 December except for a brief period after minor line cuts which occurred on 16 November. Armed reconnaissance has not been authorized for this line.

c. Hanoi-Haiphong Rail Line

This line has a total of 5 bridges, 40 feet or over in length. Two of these are JCS targets and both of these have been struck. The first
25X1 strike was directed against [redacted] the Hai Duong Railroad and Highway Bridge East over the Song Rang on 5 November 1965. Cloud cover on the post strike photography precluded an estimate of the damage inflicted. This target was restruck on 17 November and it is estimated that no effective

interruption of traffic was achieved. On 1 December, the bridge was struck for a third time. Post strike photography indicated some damage but it is estimated that no effective interruption of traffic was achieved by this strike.

25X1 The second bridge, [redacted] the Hai Duong Railroad and Highway Bridge over the Thai Binh was struck on 23 December. Field IPIR of 28 December reports that the bridge is probably operable. Armed reconnaissance has not been authorized on this line.

d. Hanoi to Southern Terminus of Operable Rail Line

There are 10 JCS rail or combination rail and highway bridges on this line. Nine have been struck and of these, eight have been interdicted effectively for an extended period. The tenth target, [redacted] the Co Trai Railroad and Highway Bridges lie within the prohibited area in the vicinity of Hanoi. 25X1

There is no through rail traffic between the northernmost point of interdiction, the Phu Ly Railroad Bridge over the Song Lap [redacted] 25X1 (20° 32' 50" N., 105° 55' 15" E.) and the southernmost point of interdiction, the Xom Khe Railroad Bridge over the Khe Net (DE 0617-00627) (17° 58' 30" N., 105° 55' 50" E.). It is estimated, however, that the DRV is utilizing segments of the rail line between destroyed and damaged bridges to shuttle traffic southward. In conjunction with these rail line segments, ferrying, fording, alternative highway movement and inland and coastal waterway movement are being employed to overcome the effects of the air strikes which have closed the rail line to through rail service.

Of particular significance on this line is the Thanh Hoa bridge
25X1 [redacted] This 540-foot structure was constructed with great difficulty by the DRV with Chinese Communist technical assistance and was first opened for traffic by Ho Chi Minh in May 1964. The bridge was used to promote Red propaganda on its completion. On 3 April 1965 the bridge was first struck and since that time traffic over the bridge has been interrupted by numerous restrikes (see Tab B). Service was restored and at least since 29 September 1965, the bridge has been considered serviceable for both rail and highway traffic.

Other bridges have been bypassed or restored to use by construction of new bridges or by expedient repair of the old bridge. Details of the strikes against the bridges on this line and restoration work are provided in Tab B. In general repair and reconstruction of bridges on this line have been slower than on the two China to Hanoi routes.

Highway Damage

As a result of the U. S. and South Vietnamese air interdiction program, fixed structures on over 22 of the 90 motorable routes within the authorized strike areas in North Vietnam have received significant damage. At least 12 of the 22 affected routes have constituted the primary road net, whereas the remaining 10 interdicted routes are considered part of the secondary or alternate route system.

The reported number of bridges struck since February 1965 is approaching 1,000 with lengths ranging from 20 to more than 600 feet. Damage has varied from very light to complete destruction. Although confirmation is pending concerning several structures, at least 200 bridges (or 20 per cent of those attacked) have been effectively destroyed (i.e. at least one span dropped).

Restoration of traffic across the destroyed bridge crossings has taken varied forms and the time out of service for traffic has fluctuated between 3 days and several weeks. In some cases the destroyed or damaged structure has been abandoned in favor of alternate routing.

At about 25 per cent of the destroyed bridges there have been attempts at either repair or replacement with new bridging. Repairs have involved as little as replacement of wood plank decking requiring 3 to 4 days or as much as crib and trestle work over dropped spans requiring as long as six weeks and the use of relatively scarce bridge steel for superstructure reconstruction.

Ponton bridging has been utilized to restore river crossing capability at fewer than 10 per cent of the destroyed bridges. The ponton bridges which have been installed have not been constructed at the rapid pace usually associated with the construction of tactical bridging during military operations.

About 15 per cent of the destroyed bridges have been abandoned in favor of available lower capacity routes. A very small number of crossings have been replaced by earth-filled causeways of a semi-permanent nature. The most commonly observed recovery measure employed, on about 33 per cent of the bridges destroyed, has consisted of the installation of new or use of existing fords. These have been built particularly in the inland upstream areas where normal stream depths are generally shallow. Several crossings with marginal depths have been rock lined and sometimes identified as "underwater bridges". These have been installed at a relatively slow pace (by U. S. standards) requiring up to one week.

At more difficult downstream or coastal areas ferry facilities have been either installed or reactivated at about 16 per cent of the destroyed crossings.

The DRV pace of recovery has been relatively slow as compared with U. S. work standards particularly in regard to new bridge replacement. Use of time consuming reinforced concrete construction methods has been noted in some cases where more expedient techniques would have otherwise sufficed.

Details of strikes on selected major bridges on the principal highway lines of communications are provided in Tab C.

Summary

The U. S. and South Vietnamese air strikes against major North Vietnamese railroad and highway targets have resulted in making it more difficult and costly for the DRV to support military operations in South Vietnam and Laos but have not reduced the capacities below the level required for its support of operations at current combat rates.

The time intervals of restoration of service over interdicted railroad and highway bridges have varied not only according to the nature of the damage but also according to the importance of the structure to North Vietnam and Communist China. In the cases of key bridges on the

Hanoi-Dong Dang and Hanoi-Lao Cai rail lines, restoration of service has been faster than anticipated. On the other hand restoration work on the less important rail line south of Hanoi has not been undertaken as rapidly as expected. With respect to the restoration of highway routes, the time interval of disruption loses some significance due to the flexibility of road vehicles to make use of expedients as fords and ferries or alternate routing to bypass damaged or destroyed bridges.

Because of the low order of reconstruction of struck highway bridges, opportunities for restrikes on these have been limited. Strikes have been made, however, against the expedients used at many locations to bypass damaged bridges but the nature of most expedients, i.e. ford or ferry, presents an easily repairable target. On the other hand, the effort by the DRV to restore service on the Hanoi-Lao Cai railroad line by reconstruction or repair of damaged bridges, offered opportunities for restrikes and hence an appraisal of restrike effectiveness is possible. This railroad line was successfully interdicted to through traffic from 11 July 1965 to early December.